



Nerlich, Brigitte and Jaspal, Rusi (2013) UK media representations of carbon capture and storage: actors, frames and metaphors. *Metaphor and the Social World*, 3 (1). pp. 35-53. ISSN 2210-4070

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# **UK Media Representations of Carbon Capture and Storage: Actors, Frames and Metaphors**

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## **Acknowledgements**

We would like to thank the ESRC for their financial support of project RES-360-25-0068.

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## **Abstract**

Carbon Capture and Storage (CCS) is a climate change mitigation technology which has had a rather chequered history in British policy making and in the British public sphere. This article deals with the neglected topic of representations of CCS in the British media and their possible impact on public perceptions and public policy. Public perception of CCS is shaped in part by the media which provide tools for making sense of complex technological and political issues such as CCS. This article compares articles on CCS in two UK newspapers, one national (*The Times*) and one regional (*The Aberdeen Press and Journal*) in 2011, a year during which some of the last battles over CCS demonstration projects were fought. It applies frame and metaphor analysis to a corpus of 150 articles. Findings reveal that during 2011 CCS coverage moved through a cycle of hype and disillusionment, with both newspapers reaching a trough of disappointment at the end of 2011. It will be difficult to reignite interest in CCS in this context, both in terms of media and public attention, and in terms of policy and investment. Regional confidence in national CCS policy in particular will be difficult to recover.

## 1. Introduction

Carbon Capture and Storage (CCS) is a climate change mitigation technology that attempts to prevent the release into the atmosphere of large quantities of CO<sub>2</sub> resulting from fossil fuel use in power generation and other industries. The technology aims to capture CO<sub>2</sub>, to transport it and ultimately, to pump it into underground geologic formations for the secure and long-term storage of greenhouse gases (Parson & Keith, 1998). Accordingly, the Intergovernmental Panel on Climate Change describes CCS as an “option in the portfolio of mitigation actions for stabilization of atmospheric greenhouse gas concentrations” (IPCC, 2005, p. 4).

Public understanding and acceptance of CCS are important prerequisites for the development and implementation of the technology (Ashworth, Boughen, Mayhew & Millar, 2010). Yet, the technology remains relatively unfamiliar to the general public, as evidenced by recent empirical research (see Markusson, Shackley & Evar, 2012). The media constitutes an important source of societal information concerning developments in science and technology (Anderson, Allan, Petersen & Wilkinson, 2005).

Although on the horizon of public perception from around the turn of the millennium onwards (see Shackley, McLachlan & Gough, 2003), CCS first made its appearance on the traditional UK media scene in 2004, when six articles appeared in UK newspapers, including one important letter to the *The Independent* (27 May, 2004) entitled “New weapon against global warming.” This letter can be regarded as a starting point for media engagement with CCS in the UK, contributing to investment and research in CCS and policy support for the technology in the UK.

Between 2004 and 2009 CSS was increasingly discussed in the UK press but has now largely disappeared from the media agenda, as CCS research is stalling, demonstration projects are cancelled, and support for the technology from the UK government and European Union is dwindling. Reigniting the debate, in 2012 the UK Department of Energy and Climate Change published a report calling for re-engagement with CCS (DECC, 2012). However, it is likely that the dwindling media attention will be coupled with decreased public engagement with the technology and a loss of confidence in policy makers (Shackley and Evar, 2012), especially in a context of decreasing public attention to climate change (Boykoff, 2011).

This article briefly summarises key junctures and developments in the debate on CCS from 2004 until 2012 before focussing on how two leading national and regional newspapers represented the technology in 2011 as a case study. Using metaphor and frame analysis, the article reveals some of the linguistic and cultural underpinnings for possible public understanding of CCS by focussing on the media as one source of societal information concerning the technology.

### 1.1 CCS in the global media

Numerous studies have examined public perceptions of and attitudes towards CCS in distinct geographical contexts (Sharp, 2005; de Best-Waldhober, Daamen, Ramirez-Ramirez, Faaij, Hendriks & de Visser, 2009; Ha-Duong, Nadaï & Campos 2009; Markusson, Shackley and Evar, 2012), mainly using surveys, focus groups and individual interviews. Yet, there has been very little research into the possible *sources* of public perceptions of CCS, such as the newspaper media and even less into the sources or actors quoted for and against CCS. The large body of research into media representations of climate change demonstrates the importance of considering how the media frames, literally and metaphorically, scientific and environmental concerns.[i] Media analyses of climate change mitigation strategies are particularly important, given that “[t]he

way in which the media report any new technology can radically affect the success of its implementation – how it is received by the public and other stakeholders as well as decision-makers in government and business” (Mander & Gough, 2006, p. 6). Indeed, this has enabled researchers to develop hypotheses regarding public responses to geoengineering as a climate change mitigation strategy (Nerlich & Jaspal, 2012). Nerlich and Jaspal’s (2012) paper was the first to examine the cultural and metaphorical framings of the debate surrounding geoengineering, which, like CCS, constitutes an emerging technology that aims to mitigate climate change. It sheds light on the cultural underpinnings of the public debate concerning the technology, which highlights the potential applicability of a metaphor analytical approach to the CCS debate.

Recent research into media representations of CCS has been conducted in Northern Europe and Canada, as well as Australia. One article studies and compares media coverage of CCS in Norway and Sweden (Buhr & Hansson, 2011), although the focus of this paper is on the media’s portrayal of two specific companies (stakeholders) involved in the debate on CCS technology between 2005 and 2009, rather than on media representations of the technology itself. This does not provide insight into cultural representations of CCS, which could inform meaning-making among stakeholders and laypeople.

More recently, Boyd and Paveglio (in press) have conducted a media content analysis of CCS in two leading Canadian national newspapers and two major western regional newspapers from 2004 to 2009. Their large-scale study focuses upon the Canadian context because Canada has successfully implemented CCS and plans future projects. Results suggest that the most common positive frames in CCS coverage concern (1) the ability of CCS to reduce greenhouse gas emissions, although there seems to be a ‘de-coupling’ of gas emissions from the more specific debate on climate change; (2) the opportunities offered by CCS to transform Canada (or its specific regions) into a world leader in research and technology; (3) the potential economic benefits of CCS both in terms of job creation and fossil fuel development. Conversely, their analysis suggests that the most common negative frame for CCS concerned the financial costs likely to be incurred by implementing the technology. This study outlines dominant thematic trends in Canadian media reporting of CCS over a five-year period, although there is little insight into the qualitative and, more specifically, the linguistic aspects of media reporting of CCS.

Mander and Gough’s (2006) early study also employed media content analysis in order to examine the portrayal of CCS in the United Kingdom, the United States, Canada, New Zealand and Australia between September 2005 and March 2006. Their paper focused on representational tendencies across the aforementioned countries prior to the major increase in media coverage and support for CCS, at least in the UK (see figure 1), which was observable from 2007 onwards. Despite the timing of the study, their findings suggest that the UK demonstrates “a more consistent level of reporting on CCS than the other study countries” (p. 5). The authors observe generally positive reporting of CCS, which focuses on the role of CCS in facilitating continued use of coal. While this early study shows that in 2006 CCS was “gaining representation in the press” (p. 5), there is little insight into how UK media reporting of CCS has developed in the latter half of the 2010s when this representation was waning.

### **Figure 1 about here**

It appears that the publications summarised above are the only systematic analyses of media coverage of CCS. This dearth of media analyses is surprising, given the long-standing recognition

amongst communication and media researchers that the media have an important agenda setting and opinion forming function (McCombs, 2005; McCombs & Shaw 1972).

The focus here will be on metaphor analysis of a sample of media reports on CCS, as CCS still is an emerging and future-oriented technology, shaped more by expectations than reality. As Hansson (2012, p. 76) has pointed out with reference to CCS, “[m]ethodologically, expectations may be analysed by examining, for example, metaphors and future-oriented claims [...], problem framing and a technology’s connection to positive values in relevant documents.” With relation to biotechnology in particular sociologists have studied “the role of expectations in shaping scientific and technological change” (Borup, Brown, Konrad & van Lente, 2006, p. 285). This is important as expectations are “fundamentally ‘generative,’ they guide activities, provide structure and legitimation, attract interest and foster investment” or indeed do the reverse and discourage interest and investment (Nerlich & Halliday, 2007). This “sociology of expectations” is frequently related to the study of metaphors and their use in the media (Morrison & Cornips, 2011).

The present paper builds on existing media studies of CCS in several ways. Firstly, it provides an overview of the “rise and fall” of CCS as a newsworthy, socio-politically important mitigation strategy in the UK (see Figure 1), rather than focusing primarily on periods or contexts in which CCS was almost or already implemented (e.g. Canada). Secondly, it complements the existing content media analytical studies by identifying and describing the cultural and linguistic framing through the study of metaphor in media reporting on CCS.

## **1.2. “Sources” and metaphor in CCS**

Alongside agenda setting, media researchers have also begun to study the process of “agenda building,” that is, “the process by which news organizations and journalists feature, emphasize, and/or select certain events, issues, or sources to cover over others” (Nisbet, 2008). Nisbet highlights the importance of sources in the news agenda, which defines as “the voices, actors or groups featured in news coverage such as government officials, environmentalists, or antiwar protestors.” Sources are important because their invocation may serve to attribute a given statement to an apparently reliable or knowledgeable individual or institution (Potter, 1996). Moreover, external sources can be strategically quoted in newspaper articles in order to construct a particular version of events which *prima facie* appears to be detached and independent from the newspaper, although it may covertly serve the agenda of the newspaper (Jaspal & Nerlich, in press). While there is a general consensus amongst researchers that the media agenda affects the public agenda, this paper shows that the CCS media agenda itself is largely grounded in certain stakeholder agendas – starting with the letter to *The Independent*, quoted above. Media sources are not just sources; they also actively influence media and public agendas. Indeed, in their article on metaphorical framings of avian flu, Nerlich and Halliday (2007, p. 56) argue that scientists as stakeholders strategically introduce metaphors into the media sphere, which the media reproduce, disseminate and amplify.

This paper traces the development of the media agenda around the issue of CCS, with a particular focus on the sources quoted in the newspapers and the metaphorical framing devices used (by these sources or by journalists themselves) in relation to CCS. It provides a short summary of the debate on CCS from 2004 until 2011 and then reports the results of a metaphor and frame analysis of the 2011 coverage of CCS in two prominent newspapers, a national one (*The Times*) and a local/regional one (*The Aberdeen Press and Journal* or *APJ*).

In 2011, the CCS agenda was largely a regional one, particularly focused in Scotland.

Scottish stakeholders played a major role in framing CCS around the creation of demonstration plants in both Peterhead in Aberdeenshire and Longannet in Fife. A CCS plant was initially proposed for Longannet in February 2011 but the proposal was subsequently abandoned in October 2011. Moreover, a plan for a plant in Peterhead, which had been abandoned in 2007, was revived in October 2011 and ultimately abandoned in November of the same year. Given the fluctuation in political and institutional support and stakeholder debate concerning CCS in the UK, this national context is a unique one to study, and 2011 is a particularly significant year in the CSS debate.

## **2. Political and media developments from 2004 to 2012**

### **2.1. 2004**

On 27 May, 2004 an important letter was published in the *The Independent*, entitled “New weapon against global warming,” which, in many ways, marked the starting point for social and institutional engagement with CCS. The letter was written by various academics at Imperial College and the Universities of Edinburgh, Manchester, and Aberdeen (including one of the foremost researchers into public perception of CCS, Dr. Simon Shackley). It begins by referring to a previous article published by Dr. James Lovelock on 24 May 2004, in which Lovelock makes the case for nuclear power as an energy source. The authors of the letter reply by claiming that CCS constitutes a more suitable alternative option (Ali, Bickle, Blunt, Gibbons, Haszeldine, Kemp, Lawrence & Shackley, 2004).

The authors argue that CCS would have “positive implications for the UK economy” and that it would be a “UK led” technology. They applaud “the Energy white paper [which] recognises the potential for carbon storage” and point out that “the UK Research Councils, through the newly-established UK Energy Research Centre, will shortly be setting up a wide-reaching stakeholder network.” This letter foreshadows various themes and frames which were also used in subsequent coverage, used by a network of stakeholders, namely the themes that (1) CCS will benefit the UK economy; (2) it will make the UK (or its regions) world-leading in this technology; and, of course, that (3) it will enable the UK to contribute “a weapon” in the “fight” against global warming. RACE and WAR metaphors will continue to constitute important framing devices in later media coverage of CCS, including 2011.

### **2.2. 2009 - 2012**

On 22 April 2009, the then UK Chancellor of the Exchequer Alistair Darling (of the Labour Party) announced the government budget, which he referred to as a “carbon budget,” as it contained announcements regarding new technologies intended to curb carbon emissions and to mitigate climate change. Darling stated that, “today, I am presenting the world’s first ever carbon budget, which commits Britain to cut carbon emission by 34 per cent by 2020.” He proceeded to talk about energy efficiency, renewable energy, arriving finally at the issue of CCS. He positions CCS as a vital clean technology and therefore wants to make the UK a world-leader in this field. Moreover, he announces the funding of between two and four demonstration plants.[ii]

A day after the budget, on 23 April, newspapers reported that Ed Miliband, the then Secretary of State for Energy and Climate (another important source of media announcements at that time), had proclaimed that up to four new coal-fired power plants would be built only on the condition that they be fitted with CCS facilities. This announcement referred, like so many at the

time, to building a “low carbon future” (Nerlich, 2011) and stopping dangerous climate change. Again reference is made to UK leadership in CCS. In fact he stresses that there is “no alternative to CCS if we are serious about fighting climate change and retaining a diverse mix of energy sources for our economy.”[iii]

These statements were highly supportive of CCS as the only realistic option to secure energy for the UK while mitigating climate change at the same time (see Nerlich, 2009 for further analysis of this event as it played out in the media). The media coverage that followed therefore focused mainly on the economic opportunities and the opportunities afforded by CCS to “save the planet” and build a “low carbon future.” The technology itself was rarely discussed, especially not its three principle components: capture, transportation and storage. The agenda was a primarily economic one. There was some discussion of the cost, viability and scalability (from demonstration projects to full-blown and wide-spread deployment) of the technology.

As outlined by Nerlich (2009), the economic benefits of the technology were framed using a variety of metaphors. Particularly prominent were metaphors representing forwards movement, such as RACE and JOURNEY (e.g. “racing to find a solution to climate change”; “racing to be a world-leader in CCS technology”; “racing to save the economy”). Linked to these metaphorical phrases encapsulating a forward trajectory or movement (e.g. “moving towards a low carbon economy,” “green step,” “bold step”) were others that dealt with related issues such as speed (“boost”) or the way the journey progresses and what could be expected at the end of the journey (e.g. a “bonanza”), and the kind of vehicle used (a car or engine), and so on. There was only very little negative reporting or criticism of CCS.

In 2007, a CCS competition (promised in 2004) for a first UK CCS demonstration plant was launched and cancelled four years later, in 2011, part of a series of cancellations and disappointments that marked that year.

In May 2010, in his first major speech as UK prime minister, David Cameron (Conservative Party), like the Labour government before, declared his government’s “long-term commitments” to CCS, by stating for example: “Let’s make Humberside lead the world in carbon capture and storage.”[iv] This promise of investment has so far not materialised. In 2011 CCS was still promoted as a low carbon and climate change mitigation policy but, again, promises were not kept, especially for the development of various demonstration projects in Scotland in particular.[v] Despite this, in April 2012, the Department of Energy and Climate Change released a report on CCS, entitled “CCS Roadmap: Supporting deployment of Carbon Capture and Storage in the UK.” The report outlined an “action plan” in order to “create the right market conditions to deploy technology that can contribute so much to the battle against climate change” (DECC, 2012, p. 4). The ministerial foreword of Edward Davey seemed to construct the decision not to proceed with the CCS project at Longannet in terms of a learning experience, which would facilitate the deployment of CCS elsewhere. In short, the report was said to represent the government’s “steadfast” commitment to eventual deployment of CCS. The report placed particular emphasis on (1) the identification of ways in which CCS can be rendered “cost-competitive with other low carbon technologies”; (2) knowledge exchange between the UK and overseas governments and departments in order to optimise the efficacy of CCS; (3) the identification of ways in which commercial CCS can be enabled; (4) tackling “barriers” to deployment (p. 48-49).

Although there is an acknowledgement of the potential challenges and indeed the need to overcome them, there is consistent use of optimistic language in order to characterise CCS deployment in the UK (e.g. “steadfast commitment,” “succeed,” “remove obstacles,” “exciting



possibility,” “commercial reality”). In short, the report aims to break down remaining barriers to CCS, thereby encouraging political, institutional and of course public *re*-engagement with CCS. 2011 was an important year in the development of CCS in the UK and the representations of CCS disseminated in that year may well influence public confidence in the technology and therefore public policy in 2012 and beyond, including faith in the 2012 DECC report and the re-launch of various CCS projects.

Having outlined important developments in the media and political debate concerning possible deployment of CCS technology in the UK, the paper moves now to describing the chosen case study which focuses on the similarities and differences in the use of metaphorical frames in *The Times*, a national newspaper, and the *APJ*, a regional newspaper in 2011.

### **3. CCS in 2011: A case study**

#### **3.1. Methodological issues**

##### **3.1.1. The corpus**

In order to study the media coverage of CCS in 2011 the Nexis® news database for 2011 was searched using the search term “carbon capture” (this search was conducted before Nexis® added *Guardian Unlimited* to its database). 873 articles were published in UK newspapers overall, of which 873 were newspaper articles. Amongst the national newspapers *The Times* published the most articles (n=52; as compared to double that number in 2009) and amongst the regional newspapers the *APJ* published the most (n=98 articles). These numbers suggest that the media debate concerning CCS seems to be unfolding primarily in these two outlets. They are both, to some extent, elite newspapers, with *The Times* being founded in 1785 and *The APJ* being established in 1747. They are therefore useful as indicators of how an issue is framed by and for a national or regional elite of readers. As 150 articles on CCS were published in total in the two newspapers in 2011, this made a qualitative (frame and metaphor) analysis feasible (Lyons & Coyle, 2007; Zinken, Hellsten, & Nerlich, 2008).

##### **3.1.2. Frame and metaphor analysis**

Frame analysis covers many, sometimes competing, approaches to the study of the ways in which the media, in particular, represent public issues and therefore also the way that they are understood by the readers of news. “Framing defines a dynamic, circumstantially-bound process of opinion formation in which the prevailing modes of presentation in elite rhetoric and news media coverage shape mass opinion” (Scheufele, 2011, p. 1). Framing is “the process by which a communication source, such as a news organization, defines and constructs a political issue or public controversy” (Nelson, Oxley, & Clawson, 1997, p. 221). “Frames [...] allow citizens to rapidly identify why an issue matters, who might be responsible, and what should be done” (Nisbet & Mooney, 2007, p. 56) and “the latent meaning of any frame [or topic] is often translated instantaneously by specific types of frame devices such as catchphrases, metaphors, sound bites, graphics, and allusions to history, culture, and/or literature” (Nisbet, 2009).

First, metaphorical expressions used directly in relation to CCS discourse in both *The Times* and the *APJ* were extracted, regardless of who used the metaphors and when they were used in the course of the year. We identified linguistically overt (e.g. “race”), rather than covert (e.g. “give” in “to give an answer”), metaphorical expressions in the first instance, and then linked these, where possible, to overarching conceptual metaphors. This was followed by a more detailed

analysis of the sources of the frames in the two newspapers and the time sequence in which they were used.

The authors adopted the following coding procedures. The two corpora of newspaper articles were read repeatedly in order to extract overt metaphorical expressions (such as “race”) and their positive or negative tone. These collections of expressions were compared and integrated, after which the two authors collated the expressions jointly into groupings of metaphors (see Cameron & Maslen, 2010). Some metaphorical expressions were easily sorted into groupings around what Lakoff and Johnson (1980) called “conceptual metaphors” or overarching metaphorical concepts (see also Zinken, Hellsten & Nerlich, 2008). However, not all metaphorical expressions were amenable to such grouping. Some of the expressions we collected were grouped by way of metonymy and we highlight this in the analysis. We adopted the standard practice of highlighting conceptual metaphors or grouping labels in small capitals. Examples of metaphorical expressions are highlighted in the following, made-up sentences: “Your claims can easily be *demolished*”, “She *attacked* every weak point in my argument”; “He *shot down* his argument” and so on. The overarching (conceptual) metaphor in this case would be: ARGUMENTS ARE WAR (usually rendered in small capitals).

Our purpose was to find those metaphorical framings that might have the most political and performative force in the discourse surrounding CCS, akin to research into “discourse metaphors” (Zinken et al, 2008; Musolff & Zinken, 2009). This study therefore contributes to the analysis of naturally occurring metaphors which enable people to communicate about crucial political issues at certain moments in time. Such metaphors are historically and socially situated (Deignan, 2005; Semino, 2008; Musolff, 2011) and may be quite ephemeral. However, some of the metaphorical expressions used in the media are grounded in relatively stable and familiar conceptual metaphors, experiences and narratives. In this way they have the power to influence how policy makers and publics frame and therefore manage the world we live in the near and distant future.

### 3.2. Analysis

Examples of both positive and negative framing of CCS, both metaphorically and literally, can be found in both newspapers. Positive claims about CCS (similar to the benefits highlighted in the Canadian press, see Boyd and Paveglio, in press) have highlighted that the technology could help to create jobs (especially in Scotland) and that it could therefore benefit the national or regional economy, an issue sometimes hyperbolically framed as CCS having *massive economic potential* or being a *massive opportunity*. Moreover, CCS was constructed in positive terms as *ambitious*, *revolutionary*, *groundbreaking*, *cutting edge*, and *game-changing*. While these descriptors capture the novelty (and hence the uncertainty) of CCS, they do so in a positive and optimistic manner, obscuring the potential risks and doubts surrounding the technology. Moreover, the UK and Scotland were personified as benefiting from the technology and therefore, especially Scotland, as *gaining confidence*. Accordingly, the noun *hope* was used frequently in the corpus of articles. However, there was also criticism of CCS as an *expensive dream*, for example. This section focuses on the positive and negative metaphorical frames employed in newspaper coverage and the role of actors in representing CCS to the readership.

#### 3.2.1. Positive and negative metaphorical framings

One of the oldest and most prominent positive framing devices used in the context of climate change is the war metaphor (Oreskes, 2011). So it is not surprising that CCS is being framed as a

*weapon* in the *war* or *fight* against climate change, as a tool that allows policy makers to act on climate change and to be seen as in charge or in control of the issue (similar to the framing of other policy *battles*, see Nerlich, 2004). This framing was used in 2004, as reported above, but it was less evident in 2011. This may be attributed to the focus of media reporting on job creation and economic development, rather than on mitigating climate change, an issue that, together with climate change itself, had dropped out of the news (Nisbet, 2011). The most frequent positive metaphorical framing was that of IMPLEMENTING CCS IS A RACE (with a focus on winning), attested by terms such as: race, world lead, lead, leadership, forefront, (global) front-runner, vanguard, pioneering, flag-ship, massive step forward, step in the right direction, spearhead, way ahead, ahead in the race, go ahead, accelerate and pole position.

Towards the end of the year (but at different speeds) the two newspapers began to frame CCS using more negative metaphors. From being an effective weapon in the war against climate change, the *implementation* of CCS turns into a battle (IMPLEMENTING CCS IS A BATTLE), with expressions such as: serious blow, shock, headache, and blindsided (employed in the context of Scotland losing UK government support for its CCS projects). The focus shifts from CCS as a viable technology for mitigating climate change to the controversy surrounding implementation of the technology itself. Yet, the metaphorical framings are unambiguously negative. The overarching conceptual metaphor IMPLEMENTING CCS IS A RACE still frames the media coverage, but now the focus is on losing the race or contest, rather than winning it, with metaphorical expressions such as: pulling out, kick in the long grass, collapse, abandon, delay, erratic driving, backsliding and quit. Within this context, an additional metaphorical framing emerges: CCS IS A COMMODITY THAT DOESN'T SELL ANYMORE, with expressions being used such as: shelved, pulling [something], and put on the back burner. In short, as the year progresses, there is less debate concerning the potential benefits or disadvantages of CCS as a mitigating strategy but rather on the political factors surrounding its implementation. This is highlighted by the use of a variety of other, rather one-off, metaphors such as: *cloud hanging over the future of Britain's clean coal technology*; *expensive dream*; *rug pulled* (stressing the perceived negative actions of the UK government with regard to Scottish CCS).

Both the major positive and the major negative metaphorical framings can themselves be subsumed under one meta-metaphor, namely IMPLEMENTING CCS IS A CONTEST, which can be seen as structuring a larger metaphorical narrative. CCS is a contest between opposing forces or actors, which can either be won or lost. The narrative can focus on the positive or negative end-results of this contest. If it focuses on the positive end-result, it is possible to frame CCS as what one might call a *saviour technology*, that is, as a means of saving the planet, emissions, jobs etc. This is related to framing the government, whether it is regional or national, as a *hero* in the contest. Conversely, if the story focuses on the negative outcome of the contest, it is then possible to frame CCS as a failure or disappointment, which can be attributed to the actions of an identified *villain* (the national government) and as having a negative impact for the life of an identified victim (in this case, the region of Scotland). This metaphorical narrative does indeed play out in the two newspapers, *The Times* and the *APJ*, although in slightly different ways and at slightly different speeds.

### **3.2.2. Actors and their framings of CCS**

2011 was the focal point of the contest around CCS. This means that some sources or voices quoted in the two newspapers overlap, such as Alex Salmond (Scotland's First Minister) and Ian Marchant (Chief Executive Officer of Scottish and Southern Energy). There is also some overlap

in the national sources that are quoted, such as then Secretary of State for Energy and Climate Change Chris Huhne and Minister of State for Energy Charles Hendry, as well as Treasury Minister Danny Alexander. These actors are quoted in both newspapers towards the end of 2011 when it all goes wrong, especially for Scotland.

Although Salmond obviously appears more often in the *APJ* than in *The Times*, a wide range of other sources or voices are cited, some of which (e.g. Greens, Friends of the Earth etc.) are quite critical of CCS technology. The *APJ* differs from *The Times* in that the latter does not display such a variety of sources and tends not to employ negative frames in relation to CCS.

Interestingly, one of the more critical voices on CCS in the *APJ* is that of Jeremy Cresswell, who is editor of the *APJ*'s monthly publication "Energy." One of Cresswell's more critical pieces on CCS is entitled "Bending reality with numbers," in which he questions the promised and hoped for ability of CCS to create thousands of jobs in Scotland and the UK, and another is entitled "Carbon capture, an expensive dream," in which he highlights the possible elevated costs of implementing CCS in Scotland. In both corpora, Jeremy Cresswell was only commentator who discussed issues of risk and safety around CCS.

Overall, both *The Times* and the *APJ* initially cite sources that promote CCS and highlight its positive aspects, such as Merchant and Salmond. Moreover, both newspapers report on and lament the failure to implement CCS towards the end of 2011. However *The Times* does this earlier than the *APJ*.

Throughout 2011, Salmond endorses CCS (as reported in the *APJ*). After the announcement that Scottish and Southern Energy wanted Peterhead Power Station to become the UK's first CCS plant (in February 2011) he said: *Scotland is at the forefront of low carbon energy development and deployment. This is underpinned by our world-leading climate-change targets* (*APJ*, 10 February, 2011), using metaphorical framing devices linked to a forward movement that have been in use since, at least 2004. In this context CCS is the tangible aim that various policies pursued by Scottish politicians try to achieve. Related to this aim or target of their policy endeavours is a more distant one, namely climate change mitigation. Becoming a world-leader in CCS (reaching that policy target) would also mean becoming a world-leader in climate change mitigation.

In May 2011, after Fukushima, he praises *the immense potential of CCS* and highlights the notion that Scotland has more storage capacity than competitors in the race to implement CCS, such as the Netherlands, Germany and Denmark (*APJ*, 18 May, 2011). The hope is clearly to win the race or contest to implement CCS in Scotland. Although in this argument, the race metaphor involves Scotland and Scottish CCS policy rather than CCS itself (which of course does not yet exist anywhere in Britain), one can argue that there is a metonymical link between the two, as Scotland stands for that part of Britain where CCS should be located, and as Scotland pursues a policy for the implementation of CCS. Leading and ultimately winning the race to implement CCS would therefore be a win for Scotland, a win that would be a political and economic one, but would also bolster national pride.

Surprisingly, even in November, when, according to *The Times* all (at least Longannet) was already lost and, Salmond still uses the positive *race* framing, clinging to the hope that CCS could still be implemented in Peterhead. An agreement with Scottish Southern Energy and Shell is framed as *important step forward* and, as in the beginning of the year, Salmond makes reference to *world-leading expertise* and claims that Scotland remains *in the vanguard*. This metaphorical framing based on a forward movement is echoed in the same article by an MP who speaks of a *global forefront* and of a need *to go ahead* (*APJ*, 10 November, 2011). This differs from *The*

*Times* coverage, in which a loss of hope and a stalling of movement with regard to CCS is manifested in the language employed from early October onwards. For example, *The Times* uses metaphors such as *shelved* and *serious blow to Alex Salmond* (*The Times*, Scotland edition, 7 October). Ultimately, the *APJ* also switched to negative metaphorical framing devices in a rather sudden manner on 29 November 2011, with the headlines: *Rug pulled on carbon capture bid* and *Ministers' cash switch puts carbon capture in jeopardy*. There was a discernible use of metaphorical frames such as *blindsided*, *kicked in the long grass* (a quote from MPs), *shock* and *back burner*.

Overall then, very similar metaphorical frames, both positive and negative, are used in *The Times* and the *APJ*. Positive framing devices are most frequently observable within quotes from particular sources rather than to the newspaper itself. This could be regarded as an example of strategic quoting, whereby journalists attribute particular (usually controversial, but in this case promotional) assertions to external actors, in order to reproduce a particular media agenda so that it appears to be detached and independent from the newspaper itself (Jaspal & Nerlich, in press). Conversely, negative or critical metaphorical framing devices are prevalent in the main body of the article or in more investigative articles written by journalists. However, there is a difference in the timing of the negative framing. Whereas *The Times* reports on 7 October that *Scottish Power is on the verge of cancelling its pioneering £1billion carbon capture and storage project at Longannet power station*, this is not reported in the *APJ*, and there is no use of terms such as *serious blow*, *ending hopes*, *was hoped* and *shelved* (7 October) or *hopes that Britain could become a leader in the carbon capture are threatened by doubts, close to pulling out* etc. (8 October). On 20 October, Salmond is quoted in *The Times* as condemning the Government and deploring *an enormous lost opportunity*. In contrast, on 21 October a headline in the *APJ* still reads *Peterhead ahead in race for cash* and in the text the reporter writes: *Longannet is dead. Long live carbon capture and storage*. This last expression is a calque based on *the king is dead, long live the king*. The expression is not a race metaphor as such, but it can be linked to it through an image of a relay race. There is a discernible rhetorical effort not to give up hope after Longannet and to construct CCS as positive for the future of Scotland. There is continued optimism in *APJ* coverage right up until 29 November, when neither Longannet nor Peterhead survive the race to implement CCS. Ultimately, the race seems to be lost as funding is lost, both from industry and government.

#### 4. Discussion

The year 2011 began on an optimistic note but ended on a pessimistic one in both *The Times* and *APJ*. Initially, both outlets constructed CCS as a technology promising positive change (economic and environmental), but coverage in both ended on a negative note, constructing CCS as a disappointment, and in the case of the *APJ* as very deep disappointment. Both newspapers deployed similar metaphorical frames, although their deployment followed a different sequence.

The news agenda around CCS is defined by *issues*, *events*, *sources* and *framing*. The main issue regarding CCS is its implementation as climate change mitigation option; events are publications of government budgets, investment promises by industry, reports by academics and so on; sources include the voices, actors, or groups featured in news coverage; and framings are linguistic choices (especially choices of metaphor) that set the tone of the debate and influence

political actions and industrial investment. In the case study examined here, the voices of government and industry actors were very much in favour of CCS (with only a few voices of reflection and critique appearing in the *APJ*). From top government pronouncements at the national level down to the regional level implementing CCS was seen as (and even hyped as) positive and beneficial and framed as winning an economic and climate change race.

This view and the framings of CCS changed under the impact of financial cut-backs, not because actors and stakeholders suddenly changed their minds. The result of this political *kicking CCS into the long grass* (an expression derived from the game or contest of golf) will not only be disillusionment and disappointment, but a substantial loss of trust in a government and policy maker who may be seen as good at talking the CCS talk (especially adopting the race and leadership frame, which is re-emerging in the first half of 2012), but not strong enough to take charge of the issue.

The coverage of CCS in 2011 follows a hype-disillusionment cycle that characterises many emerging technologies and their media coverage (see Hansson, 2012). One of the ways to study this cyclical nature of hype and disillusionment or hope and disappointment surrounding an emerging technology is through the study of metaphors as framing devices (see Nerlich and Halliday, 2007). The findings emerging from this metaphor and frame analysis support some of the findings by Shackley and Evar (2012), but not all. They found that “while public attention to CCS has generally been mounting since 2008, an increasing lack of confidence in CCS has emerged” (Hansson, 2012, p. 76). We have shown that media attention has begun to drop after 2009 and our analysis of media coverage in 2011 seems indicative of a decrease in confidence in CCS. Given the fall from grace of metaphorical framings focusing on forward movements and trajectories, it will in the future probably require much economic and policy will as well as linguistic and metaphorical engineering to attract new media attention, to reignite public confidence in CCS delivery, and begin the hype cycle again (and there are indications that this is what is happening in 2012). Race and contest, especially leadership metaphors, will probably be met with some scepticism if not cynicism in the future.

## 5. References

- Ali, T., Bickle, M., Blunt, M., Gibbons, J., Haszeldine, S., Kemp, A., Lawrence, C., & Shackley, S. (2004). Letter: New Weapon against global warming. *The Independent*, May 27, p. 38.
- Anderson, A., Allan, S., Petersen, A., & Wilkinson, C. (2005). The framing of nanotechnologies in the British newspaper press. *Science Communication*, 27(2), 200–220.
- Ashworth, P., Boughen, N., Mayhew, M., & Millar, F. (2010). From research to action: Now we have to move on CCS communication. *International Journal of Greenhouse Gas Control*, 4, 426–433.
- Borup, M., Brown, N., Konrad, K., & van Lente, H. (2006). The sociology of expectations in science and technology. *Technology Analysis & Strategic Management*, 18(3/4), 285–98.
- Boyd, A., & Paveglio, T. B. (in press). Front page or ‘buried’ beneath the fold: Media coverage of carbon capture and storage. *Public Understanding of Science*.
- Boykoff, M. (2011). *Who speaks for the Climate? Making sense of media reporting on*

- climate change*. Cambridge, UK: Cambridge University Press.
- Buhr, K., & Hansson, A. (2011). Capturing the Stories of Corporations: A Comparison of Media Debates on Carbon Dioxide Capture and Storage in Norway and Sweden. *Global Environmental Change*, 21, 336-345.
- Cameron, L., & Maslen, R. (eds.) (2010). *Metaphor analysis: Research practice in applied linguistics, social sciences and the humanities*. London: Equinox.
- de Best-Waldhober, M., Daamen, D., Ramirez-Ramirez, A., Faaij, A., Hendriks C., & de Visser, E. (2009). Informed public opinions on CCS in comparison to other mitigation options. *Energy Procedia*, 1(1), 4795-4802.
- DECC (2012). CCS roadmap: Supporting deployment of carbon capture and storage in the UK. Department of Energy and Climate Change. Retrieved from <http://www.decc.gov.uk/assets/decc/11/cutting-emissions/carbon-capturestorage/4899-the-ccs-roadmap.pdf> on 12 December 2012.
- Deignan, A. (2005). *Metaphor and corpus linguistics*. Amsterdam & Philadelphia: John Benjamins.
- Ha-Duong, M., Nadaï, A., & Campos, A.S. (2009). A survey on the public perception of CCS in France. *International Journal of Greenhouse Gas Control*, 3(5), 633-640.
- Hansson, A. (2012). Colonizing the future: the case of CCS. In N. Markusson, S. Shackley, & B. Evar (Eds) *The social dynamics of carbon capture and storage: Understanding representation, governance and innovation* (pp. 74-90). London: Routledge.
- IPCC (2005). IPCC Special Report. Carbon capture and storage. Summary for Policymakers.
- Jaspal, R., & Nerlich, B. (in press). When climate science became climate politics: British media representations of climate change in 1988. *Public Understanding of Science*.
- Lakoff, G., & Johnson, M. (1980). *Metaphors We Live By*. Chicago: Chicago University Press.
- Lyons, S., & Coyle, A. (eds.) (2007). *Analysing qualitative data in psychology*. London: Sage.
- Mander S., & Gough C. (2006). Media framing of new technology, the case of carbon capture and storage. Paper presented at the 8th International Conference on Greenhouse Gas Control Technologies. 19 June 2006.
- Markusson, N., Shackley, S. & Evar, B. (Eds) (2012). *The social dynamics of carbon capture and storage: Understanding representation, governance and innovation*. London: Routledge.
- McCombs, M (2005). A look at agenda-setting: Past, present and future. *Journalism Studies*, 6(4), 543-57.
- McCombs, M., & Shaw, D. (1972). The agenda-setting function of mass media. *Public Opinion Quarterly*, 36(2), 176-87.
- Morrison, M., & Cornips, L. (2011). Exploring the role of dedicated online biotechnology news providers in the innovation economy. *Science, Technology and Human Values*, 37(3), 262-285.
- Musolff, A. (2011). *Metaphor in political dialogue*. *Language and Dialogue*, 1(2), 191-206.
- Musolff, A., & Zinken, J. (eds.) (2009). *Metaphor and discourse*. Basingstoke: Palgrave Macmillan.
- Nelson, E. T., Oxley, Z. M., & Clawson, R. A. (1997). Towards a psychology of framing effects. *Political Behavior* 19(3), 221-246.
- Nerlich, B. (2004). Towards a cultural understanding of agriculture: The case of the 'war' on foot and mouth disease. *Agriculture and Human Values*, 21(1), 15-25.

- Nerlich, B. (2009). The 'world's first carbon budget': Brigitte Nerlich laments a lost opportunity. *People & Science* (The British Science Association), December issue, p. 13. Retrieved from <http://www.britishsociety.org/web/News/ReportsandPublications/Magazine/index.htm> on 12 September 2010.
- Nerlich, B. (2011). 'Low carbon' metals, markets and metaphors: the creation of economic expectations about climate change mitigation. *Climatic Change*, online first, DOI: 10.1007/s10584-011-0055-3
- Nerlich, B., & Halliday, C. (2007). Avian flu: the creation of expectations in the interplay between science and the media. *Sociology of Health and Illness*, 29(1), 46-65.
- Nerlich, B., & Jaspal, R. (2012). Metaphors we die by? *Geoengineering*, metaphors and the argument for catastrophe. *Metaphor and Symbol*, 27(2), 131-47.
- Nisbet, M. C. (2008). Agenda building. Unpublished manuscript. Retrieved from 147.9.1.95/docs/agenda.pdf on 12 October 2012.
- Nisbet, M. C. (2009). Communicating climate change: Why frames matter for public engagement. *Environment*, March-April. Retrieved from <http://www.environmentmagazine.org/Archives/Back%20Issues/March-April%202009/Nisbet-full.html> on 12 October 2012.
- Nisbet, M.C. (2011). Public opinion and political participation. In D. Schlosberg, J. Dryzek, & R. Norgaard (Eds.). *Oxford Handbook of Climate Change and Society* (pp. 355-368). London, UK: Oxford University Press.
- Nisbet, M.C., & Mooney, C. (2007). Framing science. *Science* 316(5821), 56.
- Oreskes, N. (2011). Metaphors of warfare and the lessons of history: Time to revisit the carbon tax? *Climatic Change*, 2, 223-230.
- Parson, E.A., & Keith, D.W. (1998). Fossil fuels without CO<sub>2</sub> emissions. *Science*, 282 (5391), 1053-1054
- Potter, J. (1996). *Representing reality*. New York: Sage.
- Scheufele, D.A. (2011). The state of framing research. Unpublished manuscript. Retrieved from [pcl.stanford.edu/research/2011/scheufele-framing.pdf](http://pcl.stanford.edu/research/2011/scheufele-framing.pdf) on 12 October 2012.
- Semino, E. (2008). *Metaphor in discourse*. Cambridge: Cambridge University Press.
- Shackley, S., & Evar, B. (2012). Up and down with CCS: the issue-attention cycle and the political dynamics of decarbonisation. In N. Markusson, S. Shackley, & B. Evar (Eds) *The social dynamics of carbon capture and storage: Understanding representation, governance and innovation* (pp. 149-171). London: Routledge.
- Shackley, S., McLachlan, C., & Gough, C. (2003), Public Perceptions of Carbon Capture and Storage in the UK, A report for the Department of Trade and Industry, London.
- Sharp, J. (2005). Public attitudes toward geological disposal of carbon dioxide in Canada. Unpublished Masters thesis, Simon Fraser University, Vancouver, Canada.
- Zinken, J., Hellsten, I., & Nerlich, B. (2008). Discourse metaphors. In R.M. Frank, R. Dirven, T. Ziemke, & E. Bernárdez (eds.), *Body, language and mind* (p. 363-386). York: Mouton de Gruyter.





Figure 1 Media volume relating to CCS, 2004-2011 based on Nexis®, search term “carbon capture” in UK newspapers (moderate similarity setting)

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[i] The ‘Talking Climate’ website provides an online database of resources related to climate change communication, see <http://talkingclimate.org/database/>

[ii] <http://www.publictechnology.net/modules.php?op=modload&name=News&file=article&sid=19790>

[iii] <http://www.fco.gov.uk/en/newsroom/latest-news/?view=PressR&id=16820235>

[iv] For a full transcript of the speech given by Prime Minister David Cameron on 28 May 2010, please see <http://www.number10.gov.uk/news/transforming-the-british-economy-coalition-strategy-for-economic-growth/>

[v] For the Scottish Carbon Capture and Storage website, please see <http://www.sccs.org.uk/>